Apple *II*e

ProDOS Supplement to the Apple *II*e Owner's Manual

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Apple *II*e

ProDOS Supplement to the *Apple IIe Owner's Manual*

About This Supplement

This *ProDOS Supplement* replaces Chapter 4 in the *Apple IIe Owner's Manual*. Not all Apple IIe owners need to read it.

Who Should Read It: Look at the back cover of your *Apple IIe Owner's Manual*. Find the part number in the lower-right corner. If that part number is 030-0356-A, 030-0356-B, or 030-0356-C, you need this *Supplement*. Your *Owner's Manual* was written with the DOS 3.3 operating system in mind, but you have the ProDOS™ operating system.

If your *Owner's Manual* has any other part number, you can ignore this *Supplement*. Your *Owner's Manual* was written with ProDOS in mind.

If you plan to use both ProDOS *and* DOS 3.3, you will want to refer to both versions of Chapter 4.

Your *Owner's Manual* still refers to some terms that don't apply to you if you are using only ProDOS. When you see *DOS 3.3*, think *ProDOS*. The DOS 3.3 *SYSTEM MASTER* disk is equivalent to the *ProDOS User's Disk*. Ignore references to Integer BASIC.

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Using the ProDOS Operating System

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Using the ProDOS Operating System

Introduction

This chapter describes the role of operating systems in general and introduces the ProDOS operating system.

This chapter includes some hands-on exercises that show you what an operating system does. It also introduces you to programming in Applesoft BASIC.

ProDOS (rhymes with *slow toss*) is short for Professional Disk Operating System.

You will learn how

- to restart the computer when the power is already on
- to back up your *ProDOS User's Disk* by making a new copy of it
- to see what files are on a disk
- to start a program running and then stop it
- to format new disks
- to understand error messages
- to use Applesoft BASIC to do calculations
- to write a simple program and save it on a disk.

What an Operating System Does

An **operating system** is the software that organizes the computer's resources and makes them available to you and to application programs running on the computer. At your command, an operating system

- copies programs, data files, and volumes (whole disks)
- tells you what files are on a disk
- sends information to printers and other output devices
- prepares disks for use
- stores (writes) information on disks
- retrieves (reads) information from disks.

Did you notice that most of an operating system's jobs have to do with disks? The *DOS* in ProDOS stands for *Disk Operating System.*

What an Application Program Is

Application programs work together with an operating system to let you perform specific tasks. For example, a word processing program is an application program that lets you write, edit, file, and print reports, letters, and so on. Other application programs let you manipulate numbers, draw graphs, study French, play simulation games, and so on.

Before you can run an application program, two things must happen:

- First, you must load operating system software from a disk into your computer's memory.
- Second, you must load the application program itself into memory.

The operating system does not have to be ProDOS—it can, for example, be DOS 3.3 or Pascal—but it does have to be the same operating system for which the application program is designed.

What a Startup Disk Is

In computer jargon, a startup disk is sometimes called a **boot disk**, and starting up a system is sometimes called **booting**. This alludes to a system *pulling itself up by its bootstraps*.

In brief, a **startup disk** is one that contains both an operating system *and* one or more application programs. Such a disk is called *startup* because it lets you load the operating system, load an application program, and start the program running, simply by putting the disk in the disk drive and turning on the power.

When you buy an application program from your dealer, it is usually on a startup disk, so you don't have to be concerned about the operating system. Follow the instructions that come with the program. Generally, you start such a program by simply putting the disk in disk drive 1 and turning on the power.

Without any hardware modifications, your Apple IIe can run startup disks that contain any of three operating systems: ProDOS, DOS 3.3, and Pascal. For other operating systems, check with your dealer.

The ***ProDOS User's Disk*** is a startup disk. It contains the ProDOS operating system (including utility programs).

Non-Startup Disks

Many Apple computer users create their own programs and trade them with friends and coworkers. Programs like these are usually stored on non-startup disks—disks that contain application programs but no operating system.

Before you can run one of these programs, you must do two things:

- Load the operating system for which the program was written. Remember, the *ProDOS User's Disk* contains the ProDOS operating system.
- Load the application program itself from another disk.

You'll learn more about this later.

Hands-On Exercises

By now, you're probably tired of reading about operating systems and eager to put one to work. Let's do it!

Restarting the Computer When Power Is Already On

If the power is now off, put the *ProDOS User's Disk* in drive 1 and use the startup procedure described in section "Starting Up (Booting) the System" in Chapter 2 of the *Owner's Manual*.

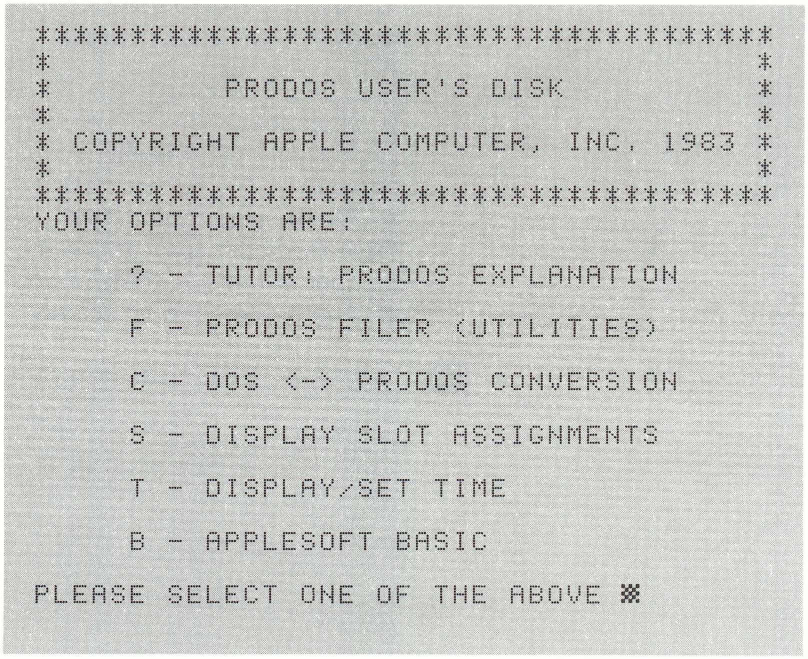
This is the best way to restart your computer when the power is already on. This procedure works with *any* startup disk.

What You Do	What Happens
1. Insert the *ProDOS User's Disk* in drive 1, and close the drive door.	
2. Press , then hold it down while pressing CONTROL-RESET.	
3. Release CONTROL-RESET.	
4. Release .	The computer beeps at you, and the disk drive's light comes on. The drive whirs and clicks while the information on the disk is read into (transferred to) the computer's memory. Then the drive's light goes out, and a startup display appears on the screen.

It is possible to restart your computer by turning the power first off, then on again—but this causes unnecessary wear on the computer's power switch and circuitry.

The ProDOS Startup Display

Every startup disk has its own startup display, and startup displays don't all look alike. The display shown is the one you see when you either start up or restart the system with the *ProDOS User's Disk* in drive 1.



```
****************************************
*                                      *
*          PRODOS USER'S DISK          *
*                                      *
* COPYRIGHT APPLE COMPUTER, INC. 1983  *
*                                      *
****************************************
YOUR OPTIONS ARE:

     ? - TUTOR: PRODOS EXPLANATION

     F - PRODOS FILER (UTILITIES)

     C - DOS <-> PRODOS CONVERSION

     S - DISPLAY SLOT ASSIGNMENTS

     T - DISPLAY/SET TIME

     B - APPLESOFT BASIC

PLEASE SELECT ONE OF THE ABOVE ▒
```

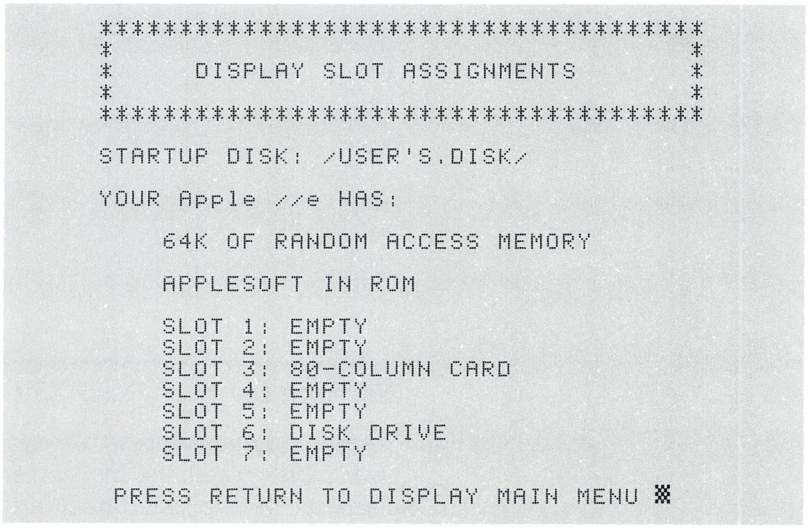
Backing Up Your ProDOS User's Disk

You should make copies of important disks like your *ProDOS User's Disk*. Then, if a disk is damaged, you have not lost its contents. This is called **backing up** your disks.

By the Way: Some application disks that you buy from a dealer may be copy-protected. This means that you can't make your own backup copies of these disks. However, such programs are often sold with a backup disk in the package.

When you copy a disk, you need to know the number of the slot where your disk controller card is located. If you know where it is, skip the next three steps. If you don't remember, this tells you where it is.

What You Do	**What Happens**
1. With the ProDOS startup display on the screen, press (S).	This selects the `DISPLAY SLOT ASSIGNMENTS` option.
2. When the `DISPLAY SLOT ASSIGNMENTS` display appears on the screen, notice the slot location of the disk drive controller card. This is the number of the slot where *your* disk controller card is located.	In the illustration, the disk controller card is in `SLOT 6`.
3. Press (RETURN).	This takes you back to the ProDOS startup display.



```
***************************************
*                                     *
*      DISPLAY SLOT ASSIGNMENTS       *
*                                     *
***************************************

STARTUP DISK: /USER'S.DISK/

YOUR Apple //e HAS:

    64K OF RANDOM ACCESS MEMORY

    APPLESOFT IN ROM

    SLOT 1: EMPTY
    SLOT 2: EMPTY
    SLOT 3: 80-COLUMN CARD
    SLOT 4: EMPTY
    SLOT 5: EMPTY
    SLOT 6: DISK DRIVE
    SLOT 7: EMPTY

 PRESS RETURN TO DISPLAY MAIN MENU ▒
```

Here's how to make a backup copy of the *ProDOS User's Disk:*

What You Do	**What Happens**
1. With the ProDOS startup display on the screen, press F.	This selects the ProDOS Filer. The disk drive whirs for a moment.
2. When the Filer menu appears on the screen, press V.	This selects `VOLUME COMMANDS`, operations on whole disks.
3. When the `VOLUME COMMANDS` menu appears, press C.	This selects the `COPY A VOLUME` process. The program first asks for the slot number of your disk controller card.

```
-COPY-
  THE VOLUME IN SLOT: <6>
```

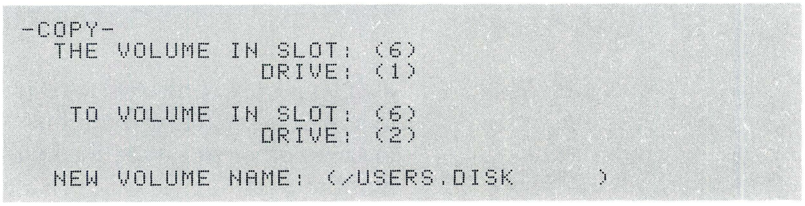
4. If your disk controller card is in slot 6, press RETURN. If it is in some other slot, type the slot number over `6`.	The cursor moves down to the next line, asking you for the number of the disk drive (there can be two drives connected to each controller card).

```
-COPY-
  THE VOLUME IN SLOT: <6>
               DRIVE: <1>
```

5. Because your *ProDOS User's Disk* is already in drive 1, press RETURN.	The cursor moves down again, to ask you for the slot and drive numbers of the blank disk where you want the *ProDOS User's Disk* to be copied.

```
-COPY-
  THE VOLUME IN SLOT: <6>
               DRIVE: <1>

   TO VOLUME IN SLOT: <6>
               DRIVE: <2>

  NEW VOLUME NAME:
```

6. Indicate the slot and drive numbers as before, and press RETURN.	A message appears at the bottom of the screen. If you have two disk drives, it is `-INSERT DISKS AND PRESS <RET>-`. If you have only one drive, it is `-INSERT SOURCE DISK AND PRESS <RET>-`.
7. If you have only one drive, leave the *ProDOS User's Disk* in the drive.	The program will let you know when to put the blank disk into drive 2.
8. Press RETURN.	The cursor moves up to the center of the screen, and the program asks what name you want to give the new disk.



```
-COPY-
  THE VOLUME IN SLOT: (6)
               DRIVE: (1)

   TO VOLUME IN SLOT: (6)
               DRIVE: (2)

  NEW VOLUME NAME: (/USERS.DISK      )
```

9. In the space between the parentheses, type `PRODOS.BACKUP` and then press RETURN. If you type any improper characters, the program ignores them and beeps at you in warning.	The name you type within the parentheses overrides the name that was there.
10. The Filer program asks whether it's all right to overwrite the former contents of the disk. If it's all right, press Y. If it's *not* all right, press N and go back to step 4.	If the destination disk is not blank—if it contains old information—you see the message `DESTROY "VOLUME NAME"?(Y/N)`▒. If the destination disk is blank, the message is `DESTROY NON-PRODOS DISK?(Y/N)`▒.

11. If your source disk (the disk you are copying from) and the destination disk are in two different drives, they can stay where they are throughout the `COPY A VOLUME` process. If you have only one disk drive, you must follow the instructions that appear on the screen—removing the source disk and inserting the destination disk, then doing the reverse, until the `COPY A VOLUME` process is complete.	The program formats the destination disk before starting the copy.
12. When the copying is complete, you see the message `COPY COMPLETE`. The `COPY A VOLUME` display remains on the screen. Press (ESC) twice, press (Q), and press (RETURN).	This returns you to the ProDOS startup display.
13. Remove the new backup *ProDOS User's Disk* and label it. Use a felt-tip pen to protect the disk from damage.	

You now have two copies of the *ProDOS User's Disk*. Keep one of them in a safe place, as a backup.

Seeing What's on a Disk

Whenever ProDOS stores information on a disk—whether that information is a program, a list of telephone numbers, or a report—it stores the information as a **file**, under the name you give it. The names and locations of all files on a disk are stored in a special disk area that ProDOS calls the **catalog**.

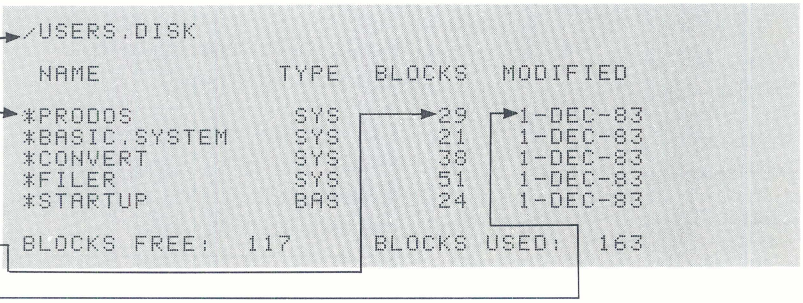
A **file** is a collection of related information, with its own filename, stored on a disk or other storage device.

The **catalog** is like a table of contents for the disk. It lists information about each file on the disk.

Here's how to get a ProDOS disk's catalog onto the screen, where you can read it:

What You Do	What Happens
1. If you're not already in Applesoft BASIC, choose option B from the ProDOS Main Menu.	] and a cursor appear on the screen.
2. Type `CAT` and press RETURN.	The catalog appears on the display. It should resemble the one illustrated.

You're in Applesoft BASIC when the] prompt character is displayed.



```
/USERS.DISK

 NAME              TYPE  BLOCKS  MODIFIED

*PRODOS             SYS      29   1-DEC-83
*BASIC.SYSTEM       SYS      21   1-DEC-83
*CONVERT            SYS      38   1-DEC-83
*FILER              SYS      51   1-DEC-83
*STARTUP            BAS      24   1-DEC-83

BLOCKS FREE:  117     BLOCKS USED:   163
```

The disk's **volume name**.

The name of the file or program.

The amount of disk space this file occupies, expressed in **blocks**. The bottom line of the display indicates the total number of `BLOCKS FREE` and the number of `BLOCKS USED`.

The date when the file was most recently `MODIFIED`.

File Protection

If the disk's catalog shows an asterisk (`*`) to the left of a filename, that file is *locked*. You can't accidentally change or overwrite a locked file. If there is no asterisk, the file is not locked.

▲ **Warning**

Being locked does not protect a file from being erased by the `COPY A VOLUME` process. To protect an entire volume (entire disk) from being overwritten, cover the write-enable notch. If there is no write-enable notch in the side of the disk's jacket, the disk is permanently write-protected.

To unlock, for example, a file named HYPNOSIS, type after the `]` prompt

```
UNLOCK HYPNOSIS
```

To confirm that HYPNOSIS has really been unlocked, use the CAT command to see that the name HYPNOSIS is not preceded by an asterisk.

To lock HYPNOSIS, simply type `LOCK HYPNOSIS`.

Running a Program Stored on a Disk

The *ProDOS User's Disk* contains some application programs you can run right now. With Applesoft's `]` prompt character displayed, type `CAT`, and press RETURN.

When the disk's catalog appears, look at the program names and file types.

> **By the Way:** You can run a file even if it's locked—you just can't change or delete it.

Here's how to run any program that has the file type BAS (for BASIC):

What You Do	What Happens
1. Type `RUN` followed by a space and the program name.	
2. Press RETURN.	It takes a few seconds for your computer to find, load, and start the program.

3. Follow the instructions, if any, that appear on the screen.	
4. To stop a running program, see the instructions in the next section.	

Stopping a Running Program

Suppose you want to stop a program while it's in progress. Programs usually tell you how, but if one doesn't, you can still exit from a program at any time. This section describes six methods. Try number 1 first, and go down the list until you find one that works.

What You Do	What Happens
1. Press ESC.	Some programs use this key to let you **escape**.
2. Press CONTROL-C. (While holding down CONTROL, press C.)	To some programs, CONTROL-C means **cancel**.
3. Press CONTROL-C and then RETURN.	Some programs don't get the hint unless you reinforce it!
4. Press CONTROL-RESET.	The program stops or returns to its opening menu and, in most cases, remains in memory, unharmed.
5. While holding down , press and then release CONTROL-RESET.	This is the **restart** procedure discussed earlier in this chapter. It is a pretty drastic way to stop a program—it clears the computer's memory, destroying any work you have there.
6. Turn off the power, then restart the computer.	You will rarely have to go this far to stop a program. But it shows the computer who's boss. This method also clears memory.

Formatting a New Disk

When you buy blank disks, they have nothing recorded on them—just like blank tape for a tape recorder. Before a disk can receive information from ProDOS, you must **format** it.

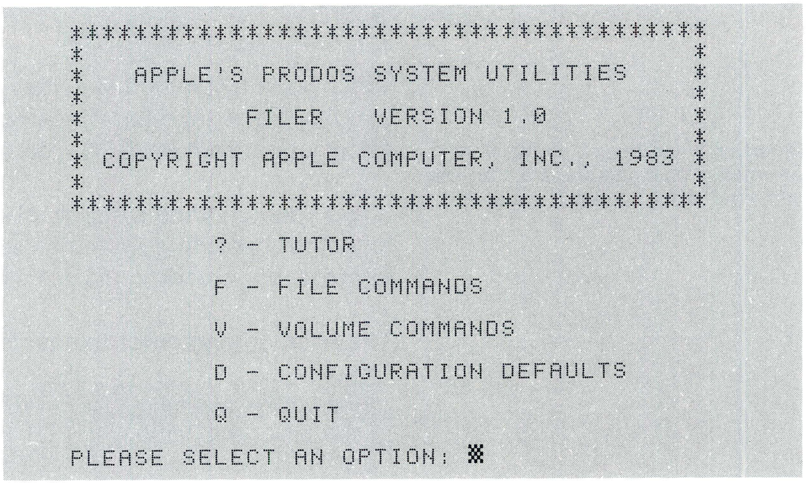
To **format** a disk means to erase any information on it and prepare it for use with a particular operating system.

If you keep on hand a supply of disks formatted by ProDOS, or by any other operating systems you might use, you never have to interrupt your work to format a disk.

The Filer, among other things, formats disks.

By the Way: You don't have to format a disk if you're going to copy the contents of another disk to it. The `COPY A VOLUME` function of the ProDOS Filer program automatically formats the destination disk before it begins a copy operation.

What You Do	What Happens
1. To get the Filer's menu on the screen, do one of the following:	
If Applesoft's `]` prompt is not on the screen, put the *ProDOS User's Disk* in drive 1 and start up the system as described earlier in this chapter. When the ProDOS startup display appears, press F.	The Filer's menu appears on the screen.
If `]` is on the screen, type `-FILER` and press RETURN.	The Filer's menu appears on the screen.

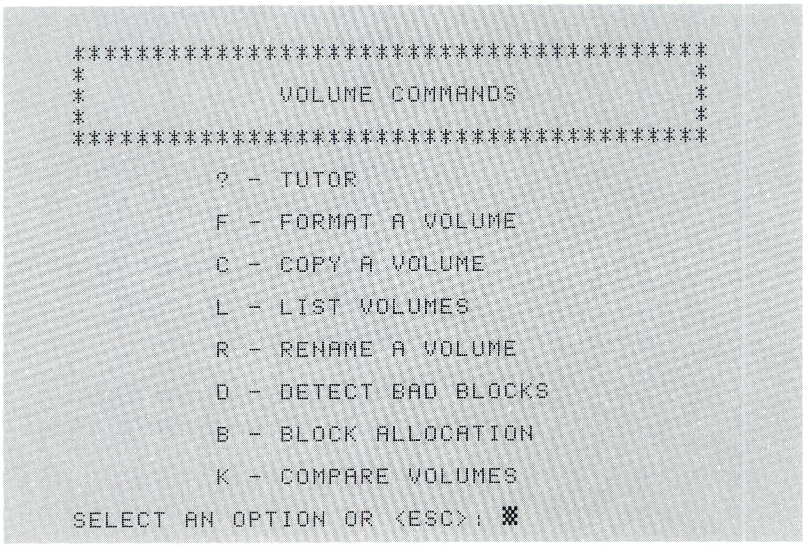


```
****************************************
*                                      *
*   APPLE'S PRODOS SYSTEM UTILITIES    *
*                                      *
*          FILER   VERSION 1.0         *
*                                      *
* COPYRIGHT APPLE COMPUTER, INC., 1983 *
*                                      *
****************************************

         ? - TUTOR

         F - FILE COMMANDS

         V - VOLUME COMMANDS

         D - CONFIGURATION DEFAULTS

         Q - QUIT

PLEASE SELECT AN OPTION: ▒
```

---

2. Press (V) to select `VOLUME COMMANDS`.

Soon the `VOLUME COMMANDS` menu appears.

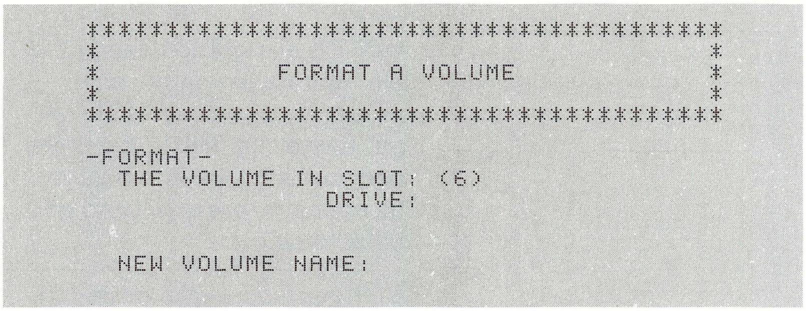


```
****************************************
*                                      *
*            VOLUME COMMANDS           *
*                                      *
****************************************

         ? - TUTOR

         F - FORMAT A VOLUME

         C - COPY A VOLUME

         L - LIST VOLUMES

         R - RENAME A VOLUME

         D - DETECT BAD BLOCKS

         B - BLOCK ALLOCATION

         K - COMPARE VOLUMES

SELECT AN OPTION OR <ESC>: ▒
```

---

3. Press (F) to choose the `FORMAT A VOLUME` option.

The `FORMAT A VOLUME` display now appears, asking you for a slot and drive number. The Filer wants to know exactly where to find the disk that is to be formatted.

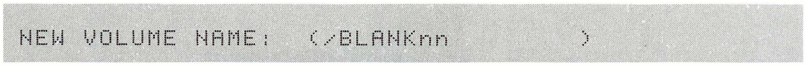


```
****************************************
*                                      *
*           FORMAT A VOLUME            *
*                                      *
****************************************

-FORMAT-
  THE VOLUME IN SLOT: (6)
               DRIVE:

  NEW VOLUME NAME:
```

4. Put the disk volume you want to format into any available disk drive. If you have only one disk drive, that means taking the *ProDOS User's Disk* out of the drive and replacing it with the disk you want to format.

5. Complete the steps in `FORMAT A VOLUME` in much the same way you completed those in `COPY A VOLUME`.

As soon as you specify the slot and drive of the disk to be formatted, the program asks what you want to name the disk you're about to format.



```
NEW VOLUME NAME:  (/BLANKnn        )
```

By the Way: If you ever feel unsure of yourself while you're using the Filer, just press (ESC) until you're on familiar ground.

6. Later in this chapter, you'll need to **save** an Applesoft program on a disk. With this in mind, name this disk PROGRAMS and press (RETURN).

7. If the disk to be formatted is blank, formatting begins. If the disk to be formatted is not blank (if it already contains information), the program asks `DESTROY "/OLD.VOLUME.NAME"? (Y/N)▒`. If you're sure it's all right to destroy the old information on the disk, press Y. If you've mistakenly put the wrong disk in the drive, and you don't want to destroy its contents, press N and go back to step 4.	When formatting is complete, the message `FORMAT COMPLETE` appears on the screen.
8. Press ESC twice, press Q, and press RETURN.	This returns you to the ProDOS startup display.
9. Remove the newly formatted disk from the drive and use a felt-tip pen to write the new volume name on the disk label. Remember that pencils and ball-point pens can damage the disk!	

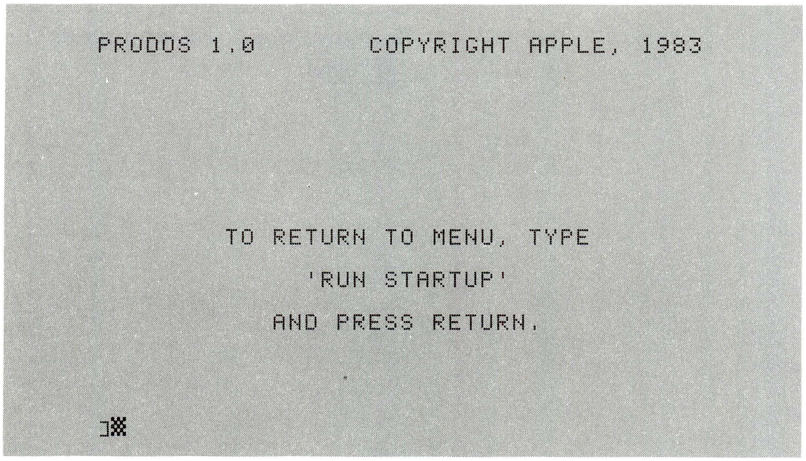
Using Applesoft BASIC

The ProDOS operating system works hand in hand with the Applesoft BASIC programming language.

Selecting BASIC

Applesoft BASIC is one of the options that can be selected from the ProDOS startup display.

What You Do	What Happens
With the ProDOS startup display on the screen, press B.	The Applesoft display appears. Applesoft's prompt character (`]`) is a cue that Applesoft is waiting for your instructions. To the right of the prompt is the cursor.



```
PRODOS 1.0          COPYRIGHT APPLE, 1983




        TO RETURN TO MENU, TYPE
              'RUN STARTUP'
          AND PRESS RETURN.


]
```

Some BASIC Basics

In this section, you'll learn a little bit about error messages.

What You Do	What Happens
1. If you haven't already done so, either start up or restart the system with the *ProDOS User's Disk* in drive 1, and press B to select Applesoft BASIC.	
2. Lock CAPS LOCK in the down position, type `HOM`, and press RETURN.	The computer beeps at you and displays the message `?SYNTAX ERROR` because neither Applesoft nor ProDOS recognizes `HOM` as a valid command.

3. Now type `HOME` and press RETURN.	This time, Applesoft understands your command—it clears the screen and moves the cursor to the upper-left corner of the screen (the home position). You will probably see the message `SYNTAX ERROR` now and then. It simply means that a program couldn't make sense out of what you typed. It usually means you misspelled a command or accidentally pressed the wrong key while typing a command.

By the Way: ProDOS commands, those that tell the computer to do something with a disk, can be either uppercase or lowercase characters. Some versions of Applesoft require that commands be uppercase. To be sure, it's a good idea to type all commands in uppercase.

Calculating With Applesoft BASIC

Did you know that your Apple II is a calculator? Of course, it's much more than that, but this exercise shows you one of a computer's most basic applications.

If you're already an experienced programmer, skip to ''Where to Learn More'' later in this chapter.

The exercises in the next two sections don't require ProDOS. In fact, you can do them even if you have no disk drive.

What You Do	What Happens
1. With Applesoft's `]` on the screen, type `PRINT 2+2` and press (RETURN).	The solution, `4`, appears immediately.
2. Try some more calculations. Use `-` for subtraction, `*` for multiplication, and `/` for division. Use the period (`.`) for the decimal point. Just remember to begin each problem with `PRINT` and end it with (RETURN).	
3. Try something more complex, such as `PRINT 345+99-435`.	The answer is `9`.

Writing a Simple Program

Maybe you're not going to be a programmer, but this gives you a taste of it. With Applesoft's `]` displayed, you're ready to go.

What You Do	What Happens
1. After the `]`, type `NEW` and press (RETURN).	This clears the computer's memory, making it ready to receive your program.
2. Lock (CAPS LOCK) down.	This helps you avoid the message `?SYNTAX ERROR`.
3. Type `10 PRINT "WHAT IS YOUR NAME?"` and press (RETURN).	`10` is a line number. Each instruction in an Applesoft program must have a line number. This tells Applesoft in what order you want it to perform the instructions. You can type instructions in any order. It's good practice to number lines `10`, `20`, and so forth, to leave room for adding lines later.

4. Type `20 INPUT NAME$` and press RETURN.	The word `INPUT` tells Applesoft to expect something called NAME to be typed at the keyboard. The `$` means that when you use the program, you're going to type text, as opposed to numeric data.
5. Type `30 PRINT "HELLO, "; NAME$` and press RETURN.	This program line tells Applesoft to display `HELLO,` and the name that you type in response to program line 20. You just **entered** a three-line **program** into the computer's memory.
6. To **run** your program, type `RUN`.	
7. When the program asks you for your name, type it next to the `?` prompt and press RETURN.	

To **enter** a program means to use the keyboard to send it to the computer's temporary memory.

A **program** is a series of detailed instructions that tell the computer how to accomplish a specific task.

To **run** a program means to cause it to perform the instructions you entered.

Does the program do what you expected? If it did, congratulations! That's programming! If not, start again by typing `NEW` and be sure to type every character exactly as shown.

Now you know how application programs learn your name and talk to you in a personal way!

Modifying Your Program

To insert lines in a BASIC program, just type new lines that begin with line numbers that you haven't already used.

What You Do	What Happens
1. With your program still in memory, type `5 HOME` and press (RETURN).	
2. Type `25 HOME` and press (RETURN).	Two new lines (numbered 5 and 25) are inserted into your program. They cause the display to clear before each message is printed.
3. To see what effect your changes have on the program's operation, type `RUN` and press (RETURN).	You modified a program by inserting new lines.

Saving Your Program

Now that you're the author of a program, you need to know how to save that program on a disk. You can use the disk that you formatted earlier in these exercises.

What You Do	What Happens
1. Put your formatted blank disk named PROGRAMS in drive 1.	
2. Type `SAVE MYFIRSTPROGRAM,D1` and press (RETURN).	`MYFIRSTPROGRAM` is your program's **filename.** `,D1` indicates disk drive 1. The disk drive hums for a moment while your program is written (copied) from memory onto the disk.
3. To confirm that your program is now on the disk, type `CAT ,D1` and press (RETURN).	The disk's catalog appears on the display.

```
/PROGRAMS
 NAME            TYPE  BLOCKS  MODIFIED
 MYFIRSTPROGRAM  BAS        1  <NO DATE>
BLOCKS FREE:  272     BLOCKS USED:     8
```

Where to Learn More

You've now had a taste of BASIC programming, and you've used some of the most important ProDOS procedures.

To learn more about programming, use the *Applesoft Tutorial*.

To learn more about ProDOS, see the *ProDOS User's Manual*.

If You Have a Problem

This section helps you if your computer system doesn't work quite right.

Disks That Don't Seem to Work

Sooner or later you will come across a disk that just doesn't seem to work.

- A faulty or blank disk might just spin, causing an even whirring sound when you try to start up the system with it or try to load a program from it.
- Non-startup disks formatted by an operating system other than the one currently in the computer's memory can cause the drive to clack away noisily.

In either case, press CONTROL-RESET (you may have to do this more than once). After about a second, the disk drive stops. Remove the disk that causes the problem, and replace it with another.

Some Error Messages

Just about every program has error messages that appear on the screen when you make a mistake. Don't panic. If you get yourself into a real mess, you can always restart the system and begin anew.

Error messages can come either from ProDOS or from Applesoft.

- The message `SYNTAX ERROR` comes from ProDOS.
- The message `?SYNTAX ERROR` comes from Applesoft.

For a complete explanation of all ProDOS error messages, see the *ProDOS User's Manual*. For a complete explanation of all Applesoft error messages, see the *Applesoft Tutorial* or the *Applesoft BASIC Programmer's Reference Manual*.

Here are some of the error messages you may encounter:

```
FILE LOCKED
```

This message appears when you try to store information in a locked file. To unlock a file named TESTDATA, type `UNLOCK TESTDATA` and press (RETURN).

```
FILE TYPE MISMATCH
```

Certain commands work only with certain file types. For example, the RUN command works with BAS (BASIC) files, but not with SYS (system) files. This message indicates that you tried to use an inappropriate combination of command and file type. To determine a file's type, use the CAT command.

I/O ERROR

This can mean there is a poor connection between the computer and the disk drive or a printer, that a disk is not properly aligned, that there is no disk in the drive, or that the disk drive door is not closed. If there is no disk in the drive, insert one. If the drive door is open, close it. If there is a disk in the drive, remove the disk, replace it in the drive, and close the drive door. If none of these things helps, check the connections between the disk drive cable and the disk controller card, and between the disk controller card and its slot.

SYNTAX ERROR

To a computer, syntax has to do with the way words and statements are used together and how they are spelled. The most common cause of a `SYNTAX ERROR` message is a typing mistake.

WRITE-PROTECTED

You see this message if you try to copy data onto a write-protected disk. A write-protected disk is one that either has no write-enable notch on its right edge, or has a covered write-enable notch.

As long as a disk is write-protected, none of its files can be modified, added to, or removed. This is an important and useful feature. It prevents you from accidentally writing over important information or valuable programs. Software that you buy from your dealer is almost always supplied on write-protected disks.

To remove write-protection from a disk that has a covered write-enable notch, remove the tape that covers the notch.

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